IN THE ABSTRACT:

Please add the following abstract paragraph:

Abstract of the Disclosure

A system for using machine learning based upon Bayesian inference using a hybrid monte carlo method to create a model for performing integrated circuit layout extraction is disclosed. The system of the present invention has two main phases: model creation and model application. The model creation phase comprises creating one or more extraction models using machine-learning techniques. First, a complex extraction problem is decomposed into smaller simpler extraction problems. Then, each smaller extraction problem is then analyzed to identify a set of physical parameters that fully define the smaller extraction problem. Next, complex mathematical models are created using machine learning techniques for all of the smaller simpler extraction problems. The machine learning is performed by first creating training data sets composed of the identified parameters from typical examples of the smaller extraction problem and the answers to those example extraction problems as solved using a highly accurate physics-based field solver. Next, the system uses Bayesian inference implemented with a Monte Carlo method to train a set of neural networks for extraction problems. After the creation of a set of models for each of the smaller simpler extraction problems, the machine-learning based models may be used for extraction.